

Application No. 10/765,797

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AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Previously Presented) A heat-sensitive lithographic printing plate precursor comprising a support having a hydrophilic surface and a coating provided on the hydrophilic surface, said coating comprising in the order given a first layer containing an oleophilic resin soluble in an aqueous alkaline developer and a second layer capable of preventing the developer from penetrating into the first layer at unexposed areas, said second layer comprising a water-repellent compound selected from the group consisting of

- a polymer comprising siloxane and/or perfluoroalkyl monomeric units, and
- a block- or graft-copolymer comprising a poly- or oligo(alkylene oxide) and a block of poly- or oligosiloxane and/or perfluoroalkyl units and

wherein the alkali-solubility of said coating increases on heating and said coating comprises an infrared light absorbing dye comprising at least one perfluoroalkyl group, wherein the infrared light absorbing dye carries a charge and at least one perfluoroalkyl group is included in a counter ion and contains at least 6 fluorine atoms.

2-3. (Canceled)

4. (Currently Amended) ~~A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein at least one perfluoroalkyl group is covalently linked to the infrared light absorbing dye and further comprises at least one perfluoroalkyl covalently bonded perfluoroalkyl group containing 6 more more fluorine atoms is included in a counter ion.~~

5. (Canceled)

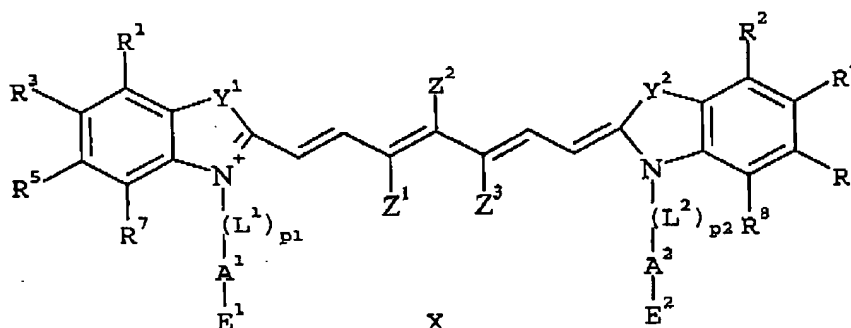
6. (Currently Amended) A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m².

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7. (Currently Amended) A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein the second layer consists essentially of the water-repellent compound and the infrared light absorbing dye.

8. (Currently Amended) A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein the infrared light absorbing dye corresponds to the following formula:



wherein

$-L^1-$ and $-L^2-$ independently represent a divalent linking;

$-E^1$ and $-E^2$ independently represent a neutral, anionic or cationic terminal group selected from

alkyl, $-OH$, $-H$, $-Cl$, $-Br$, $-F$ (neutral groups);

$-SO_3^-$, $-SO_4^-$, $-PO_3^{2-}$, $-PO_4^{2-}$, $-COO^-$ (anionic groups);

$-[NR^aR^bR^c]^+$ (cationic group);

R^a , R^b and R^c independently represent a hydrogen atom or an alkyl group;

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$-A^1-$ and $-A^2-$ independently represent $-C_vF_{2v}-$, $-[(CF_2)_2-O]_w-$,
 a long chain alkyl alkylene group containing at least four carbon atoms, or an optionally
 substituted alkyl, ~~alkenyl, aryl or aralkyl~~ alkylene, alkenylene, arylene or aralkylene group;

with p_1 and p_2 are 0 or 1;

with v and w are 2 or an integer greater than 2;

$-Y^1-$ and $-Y^2-$ independently represent $-CR^9R^{10}-$, $-S-$, $-Se-$, $-NR^{11}-$,

$-CH=CH-$ or $-O-$;

R^1 to R^{11} each independently represent a hydrogen atom, an optionally substituted alkyl,
 alkenyl, aryl or aralkyl group or a group selected from a halogen atom, ~~$-NO_2$, NO_2~~ , $-O-R^d$, $-$
 $CO-R^d$, $-CO-O-R^d$, $-O-CO-R^d$, $-CO-NR^dR^e$, $-NR^dR^e$, $-NR^d-CO-R^e$, $-NR^d-CO-O-R^e$, $-NR^d-CO-$
 NR^eR^f , $-SR^d$, $-SO-R^d$, $-SO_2-R^d$, $-SO_2-O-R^d$, $-SO_2NR^dR^e$ or a perfluoroalkyl group, each of
 said groups may optionally comprise a terminal group E defined above as $-E^1$ and $-E^2$ and/or
 wherein two adjacent groups selected from R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^7 , R^8 , Y^1 and Y^2 together
 form an optionally substituted 5- or 6- membered ring;

R^d , R^e and R^f independently represent a hydrogen or an optionally substituted alkyl, alkenyl,
 aryl or aralkyl group;

Z^1 and Z^3 each independently represent a hydrogen atom, an alkyl group or Z^1 and Z^3
 together represent the necessary atoms to complete an optionally substituted 5- or 6-
 membered ring;

Z^2 represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an
 amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a
 barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

X represents one or more ~~optional~~ counter ions having a total charge ~~opposite so as to make~~
 the dye electrically neutral and wherein X optionally comprises a perfluoroalkyl group
 containing at least 6 fluorine atoms;

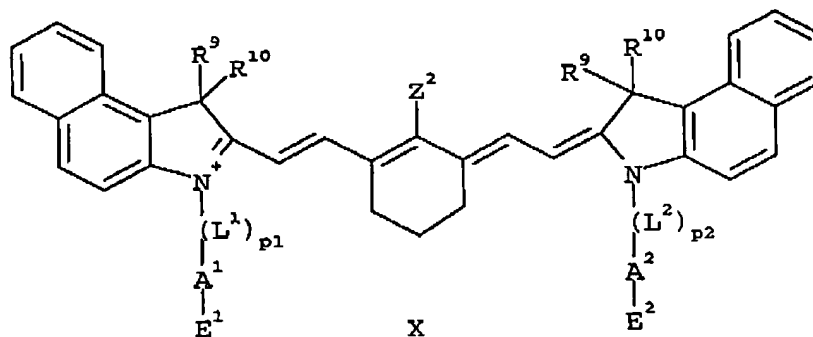
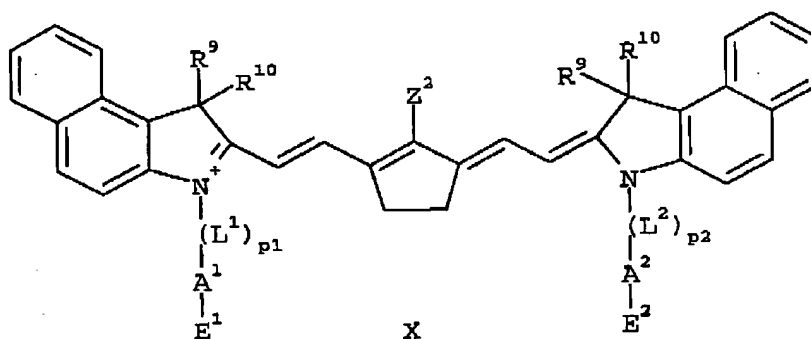
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with the proviso that at least one of the following substituents contains a perfluoroalkyl group: A^1 , A^2 , R^1 to R^{14} or X .

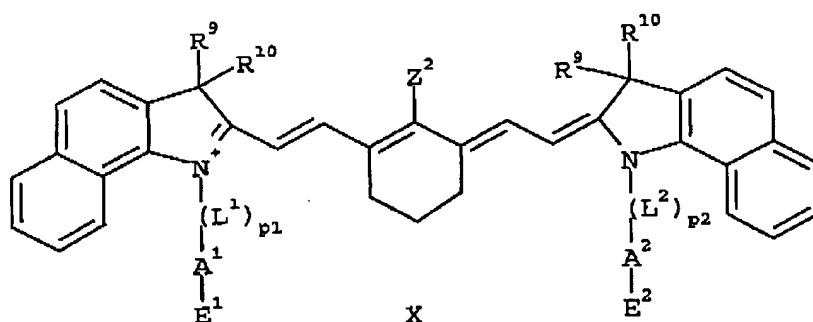
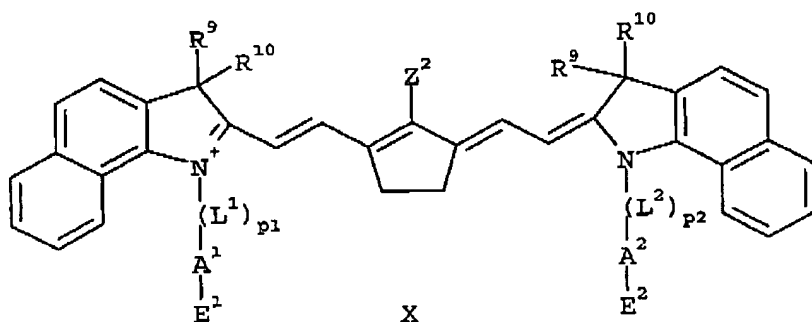
9. (Currently Amended) A ~~The heat-sensitive~~ lithographic printing plate precursor according to ~~claim 8~~ claim 37 wherein $-Z^1$ and $-Z^3$ together represent $-(CH_2)_2-$ or $-(CH_2)_3-$.

10. (Currently Amended) A ~~The heat-sensitive~~ lithographic printing plate precursor according to ~~claim 8~~ claim 9 wherein the IR light absorbing dye corresponds to one of the following formulae:



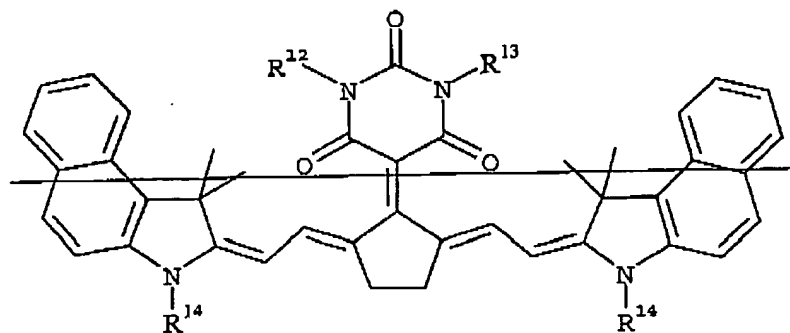
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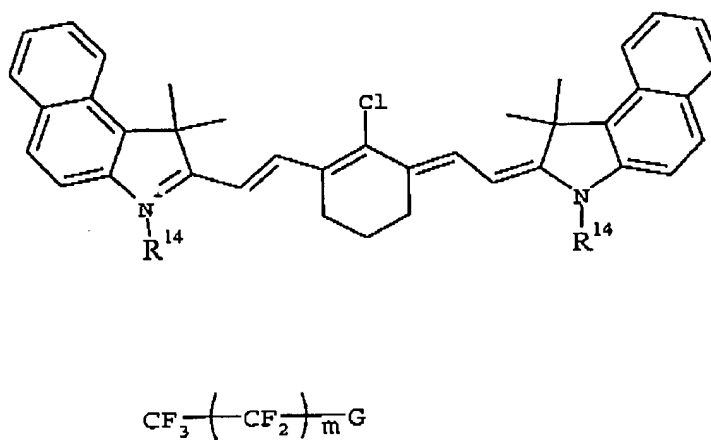
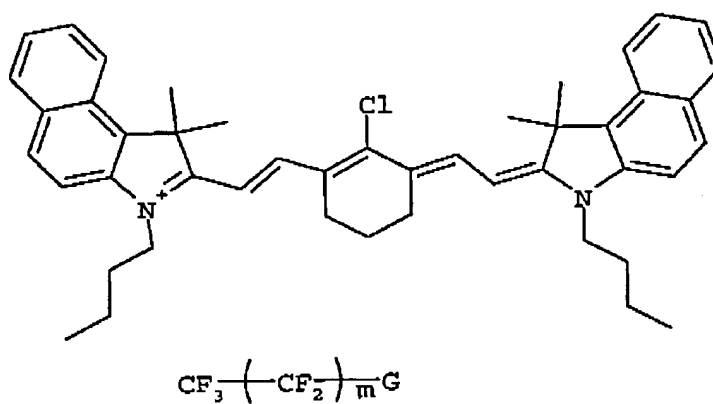
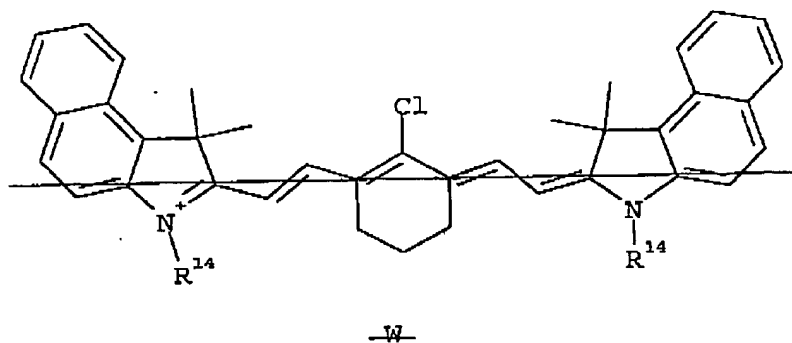
wherein $p_1, p_2, L^1, L^2, A^1, A^2, E^1, E^2, R^9, R^{10}, Z^2$ and X have the same meaning as defined in claim 8.

11. (Currently Amended) ~~A~~ The heat-sensitive lithographic printing plate precursor according to claim 8 claim 9 wherein the IR light absorbing dye corresponds to one of the following formulae:



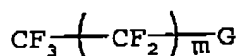
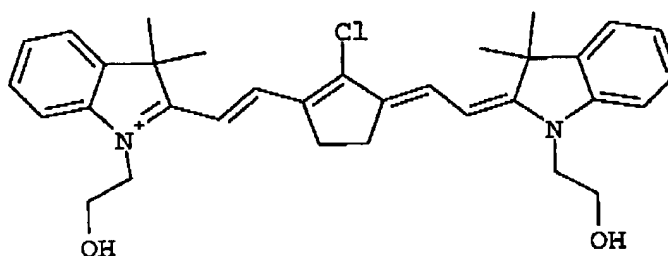
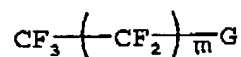
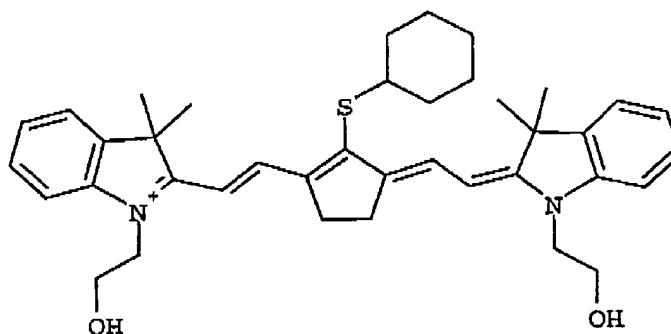
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wherein

m is 2 or an integer greater than 2;

~~R¹² and R¹³ independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a perfluoroalkyl group which may optionally comprise a terminal group E defined as E¹ and E² in claim 8;~~

R¹⁴ represents $-(\text{CH}_2)_2-\text{OCO}-(\text{CH}_2)_2-(\text{CF}_2)_k-\text{CF}_3$;

with k is 2 or an integer greater than 2; and

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~~W~~ represents Cl^- , Br^- , I^- , F^- , ClO_4^- , BF_4^- ;

G represents SO_3^- , SO_4^- , SO_3^- , SO_4^- or COO^- .

12-16. (Canceled)

17. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 4 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m².

18-20. (Canceled)

21. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 4 wherein the second layer consists essentially of the water-repellent compound and the infrared light absorbing dye.

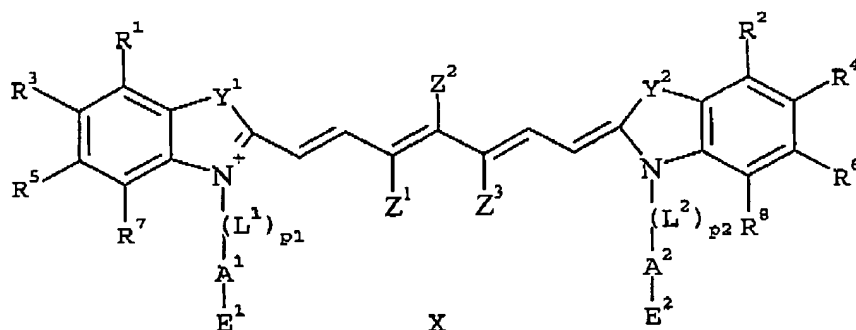
22. (Canceled)

23. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 6 wherein the second layer consists essentially of the water-repellent compound and the infrared light absorbing dye.

24. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 4 wherein the infrared light absorbing dye corresponds to the following formula:

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wherein

$-L^1-$ and $-L^2-$ independently represent a divalent linking;

$-E^1$ and $-E^2$ independently represent a neutral, anionic or cationic terminal group selected from

alkyl, $-OH$, $-H$, $-Cl$, $-Br$, $-F$ (neutral groups);

$-SO_3^-$, $-SO_4^-$, $-PO_3^{2-}$, $-PO_4^{2-}$, $-COO^-$ (anionic groups);

$-[NR^aR^bR^c]^+$ (cationic group);

R^a , R^b and R^c independently represent a hydrogen atom or an alkyl group;

$-A^1-$ and $-A^2-$ independently represent $-C_vF_{2v}-$, $-[(CF_2)_2O]_w-$,

a long chain ~~alkyl~~ alkylene group containing at least four carbon atoms, or an optionally substituted ~~alkyl~~, ~~alkenyl~~, ~~aryl~~ or ~~aralkyl~~ alkylene, alkenylene, arylene or aralkylene group;

with p_1 and p_2 are 0 or 1;

with v and w are 2 or an integer greater than 2;

$-Y^1-$ and $-Y^2-$ independently represent $-CR^9R^{10}-$, $-S-$, $-Se-$, $-NR^{11}-$,

$-CH=CH-$ or $-O-$;

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R^1 to R^{11} each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom, $-\text{NO}_2$, $-\text{NO}_2$, $-\text{O}-R^d$, $-\text{CO}-R^d$, $-\text{CO}-\text{O}-R^d$, $-\text{O}-\text{CO}-R^d$, $-\text{CO}-\text{NR}^d R^e$, $-\text{NR}^d R^e$, $-\text{NR}^d-\text{CO}-R^e$, $-\text{NR}^d-\text{CO}-\text{O}-R^e$, $-\text{NR}^d-\text{CO}-\text{NR}^e R^f$, $-\text{SR}^d$, $-\text{SO}-R^d$, $-\text{SO}_2-R^d$, $-\text{SO}_2-\text{O}-R^d$, $-\text{SO}_2\text{NR}^d R^e$ or a perfluoroalkyl group, each of said groups may optionally comprise a terminal group E defined above as $-\text{E}^1$ and $-\text{E}^2$ and/or wherein two adjacent groups selected from R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^7 , R^8 , Y^1 and Y^2 together form an optionally substituted 5- or 6- membered ring;
 R^d , R^e and R^f independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

Z^1 and Z^3 each independently represent a hydrogen atom, an alkyl group or Z^1 and Z^3 together represent the necessary atoms to complete an optionally substituted 5- or 6- membered ring;

Z^2 represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

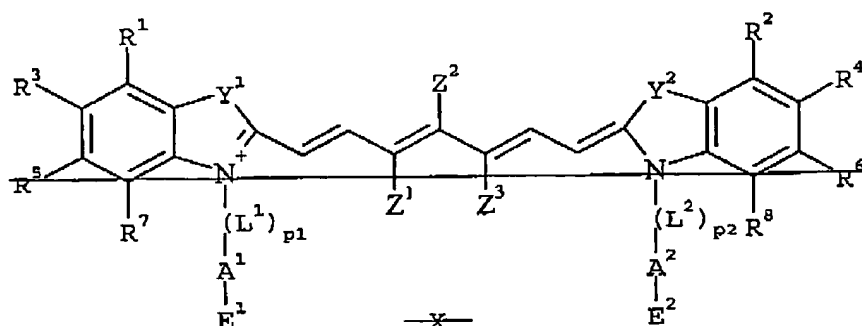
X represents one or more counter ions having a total charge opposite so as to make the dye electrically neutral and wherein X comprises a perfluoroalkyl group containing at least 6 fluorine atoms;

with the proviso that at least one of R^1 to R^{11} contains a perfluoroalkyl group or at least one of $-\text{A}^1-$ and $-\text{A}^2-$ contains a $-\text{C}_v\text{F}_{2v}-$ group or a $-(\text{CF}_2)_2-\text{O}-$ group.

25. (Currently Amended) A The heat sensitive lithographic printing plate precursor according to claim 36 claim 24 wherein, ~~the infrared light absorbing dye corresponds to the following formula:~~

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wherein

L^1 and L^2 independently represent a divalent linking;

E^1 and E^2 independently represent a neutral, anionic or cationic terminal group selected from

alkyl, OH, H, Cl, Br, F (neutral groups);

SO_3^- , SO_4^- , PO_3^{2-} , PO_4^{2-} , COO^- (anionic groups);

$[NR^aR^bR^c]^+$ (cationic group);

R^a , R^b and R^c independently represent a hydrogen atom or an alkyl group;

A^1 and A^2 independently represent C_nF_{2n} , $[(CF_2)_2O]_w$,

a long chain alkyl group containing at least four carbon atoms, or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

with p_1 and p_2 are 0 or 1;

with v and w are 2 or an integer greater than 2;

Y^1 and Y^2 independently represent CR^9R^{10} , S, Se, NR^{11} ,

$CH=CH$ or O ;

R^1 to R^{11} each independently represent a hydrogen atom, an optionally substituted alkyl,

alkenyl, aryl or aralkyl group or a group selected from a halogen atom, NO_2 , OR^d , $CO R^d$,

$CO OR^d$,

$OCO R^d$, $CONR^dR^e$, NR^dR^e , $NR^dCO R^e$, $NR^dCO OR^e$, $NR^dCONR^eR^f$, SR^d , SO

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~~R^d , SO_2-R^d , SO_2-O-R^d , $SO_2NR^dR^e$ or a perfluoroalkyl group, each of said groups may optionally comprise a terminal group E defined above as E^1 and E^2 and/or wherein two adjacent groups selected from R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^7 , R^8 , Y^1 and Y^2 together form an optionally substituted 5- or 6- membered ring;~~

~~R^d , R^e and R^f independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;~~

~~Z^1 and Z^3 each independently represent a hydrogen atom, an alkyl group or Z^1 and Z^3 together represent the necessary atoms to complete an optionally substituted 5- or 6- membered ring;~~

~~Z^2 represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;~~

~~X represents one or more counter ions having a total charge opposite to the dye and wherein X comprises a perfluoroalkyl group containing at least 6 fluorine atoms;~~

~~with the proviso that at least one of the following substituents contains a perfluoroalkyl group:~~

~~A^1 , A^3 , or R^1 to R^{11} .~~

26. (Canceled)

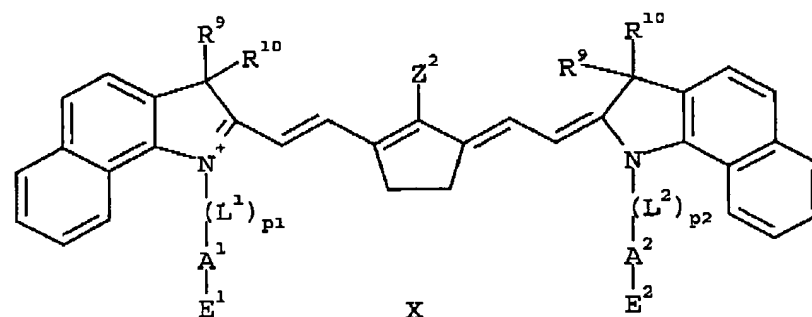
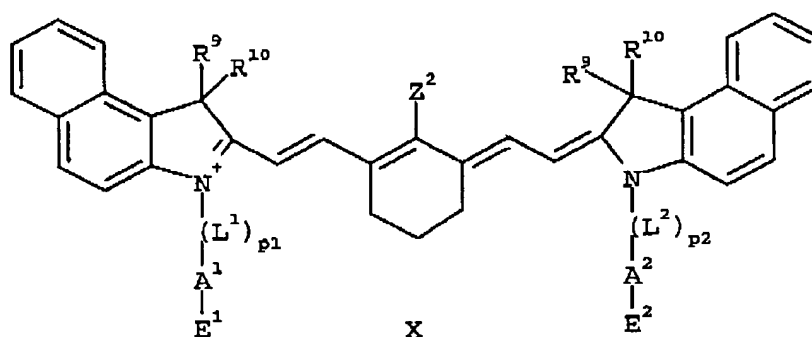
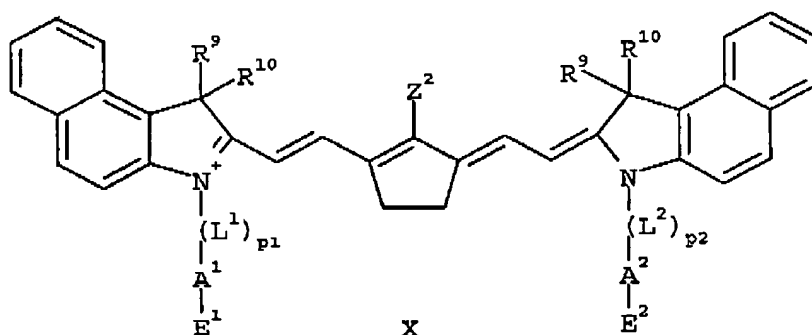
27. (Currently Amended) A The heat sensitive lithographic printing plate precursor according to claim 24 claim 25, wherein $-Z^1$ and $-Z^3$ together represent $-(CH_2)_2-$ or $-(CH_2)_3-$.

28-29. (Canceled)

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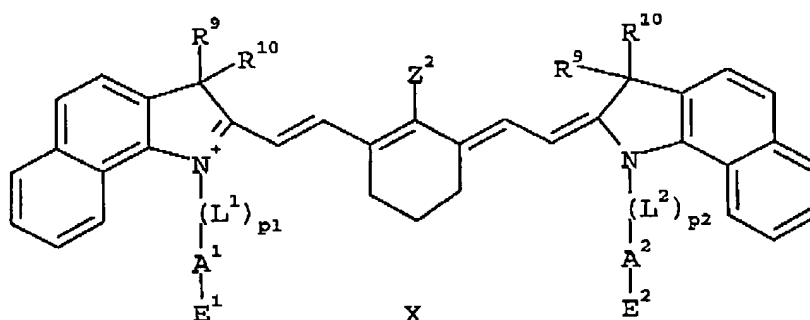
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30. (Currently Amended) A The heat sensitive lithographic printing plate precursor according to claim 27 wherein the IR light absorbing dye corresponds to one of the following formulae:



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wherein—

~~L^1 and L^2 independently represent a divalent linking;~~

~~E^1 and E^2 independently represent a neutral, anionic or cationic terminal group selected from~~

~~alkyl, OH, H, Cl, Br, F (neutral groups);~~

~~SO_3^- , SO_4^- , PO_3^{2-} , PO_4^{2-} , COO^- (anionic groups);~~

~~$[NR^aR^bR^c]^+$ (cationic group);~~

~~R^a , R^b and R^c independently represent a hydrogen atom or an alkyl group;~~

~~A^1 and A^2 independently represent C_vF_{2v} , $[(CF_2)_2O]_w$,~~

~~a long chain alkyl group containing at least four carbon atoms, or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;~~

~~with p_1 and p_2 are 0 or 1;~~

~~with v and w are 2 or an integer greater than 2;~~

R^9 and R^{10} each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom, NO_2 , NO_2 , $O-R^d$, $CO-R^d$, $CO-O-R^d$, $O-CO-R^d$, $CO-NR^dR^e$, NR^dR^e , NR^d-CO-R^e , $NR^d-CO-O-R^e$, $NR^d-CO-NR^eR^f$, SR^d , $SO-R^d$, SO_2-R^d , SO_2-O-R^d , $SO_2NR^dR^e$ or a perfluoroalkyl group, each of said groups may optionally comprise a terminal group E defined above as E^1 and E^2 ; R^d , R^e and R^f independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

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~~Z² represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;~~

~~X represents one or more counter ions having a total charge opposite to the dye and wherein X comprises a perfluoroalkyl group containing at least 6 fluorine atoms.~~

31-36. (Canceled)

37. (New) The heat-sensitive lithographic printing plate precursor according to claim 8 wherein -Z¹ and -Z³ together represent the necessary atoms to complete an optionally substituted 5- or 6-membered ring.